Putting Research to Work

RD&T E-Newsletter, September 2003

Technical information for state DOT highway professionals

Prepared by CTC & Associates LLC

Nina McLawhorn
Research Administrator
Wisconsin Department
of Transportation
608-266-3199
nina.mclawhorn@dot.state.wi.us

Research World

STANDARD SPECIFICATIONS OF 52 DOTS NOW ON ONE WEB SITE

FHWA and AASTHO have established an online clearinghouse and electronic library where users can search, review, cross-reference and download current specifications, supplements and related documents from all 50 states, the District of Columbia and Puerto Rico. Explore at www.specs.fhwa.dot.gov.

Search any – or all – of the states (and AASHTO) for specifications in main categories – such as:

- Grading
- Pavements
- Structures
- Materials
- Traffic control
- Surveying

or search across all documents for key words included in a specification. Links are also provided to transportation related ASTM specifications. An Innovative and Emerging Specifications category can be searched for states specs and background information on design-build, performance related, quality assurance and warranty.

WEB CONFERENCE SEPTEMBER 25 ON QUICK ACCESS TO TECHNICAL INFORMATION

WisDOT's RD&T Program and Library are offering a free two-hour Web conference for contractors, consulting engineers and local road and street engineers on how to find technical information on the Internet. The session will be from 9 a.m. to 11 a.m. on September 25, 2003. Participants will log on to a Web site and join a telephone conference with WisDOT instructors. Get hands-on experience using the best transportation Web sites and search engines, find WisDOT standards and specs, locate recent research from other states. To register for the demonstration send e-mail to wisdotresearch@dot.state.wi.us with your name, phone number and company/organization.

INNOVATIVE TECHNOLOGIES ON DECK

The AASHTO Technology Implementation Group (TIG), begun in 2001 to champion the implementation of ready-to-use technologies, products or processes with economic or qualitative benefits, recently chose three new technologies for accelerated deployment in 2003. The 2003 selections are the Thermal Imaging Safety Screening System (TISSS) for Commercial Vehicle Brakes, the Low Cost Highway Rail Warning System, and Fiber Reinforced Polymer (FRP) Repair of Overhead Sign Structure (OSS) Trusses. See descriptions of the new technologies on the AASHTO site at <http://www.aashtotig.org/focus_technologies/2003_technology_descriptions.stm> and in a *Focus* article at <http://www.tfhrc.gov/focus/july03/02.htm>.

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Other e-newsletters for transportation professionals: Transportation Research Board http://gulliver.trb.org/news/, Transportation Communications Newsletter http://groups.yahoo.com/group/transport-communications/.

Designing for the Future

T-REX'S BITE NOT AS BAD AS FEARED

The Denver Post reported in its August 24 edition that the I-25 Transportation Expansion Project—or "T-REX"—in one of the Denver area's busiest travel corridors hasn't disrupted regional business as much as pundits had predicted – thanks to careful public/private planning efforts. See the Colorado DOT's extensive T-REX Web site – maps, videos, traffic updates, and information tailored for large and small businesses, schools, minority populations and contractors. http://www.trexproject.com/

GETTING AROUND UTILITIES

The July 2003 issue of *Focus* newsletter highlights the FHWA guide, "Reducing Utility-Related Construction Delays" and other FHWA publications on the subject: "Avoiding Utility Relocations" and "Subsurface Utility Engineering: Enhancing Construction Activities." Approaches include looking at methods for "designing around" utilities to avoid delays and use of geophysical techniques to identify underground utility location. http://www.tfhrc.gov/focus/july03/04.htm

ARCHAEOLOGISTS ENABLE QUICK PROTECTION OF SPANISH MISSION BURIALS

Texas DOT maintained project schedule in upgrading US Route 77 in Refugio despite its archaeological and historical sensitivity. Having conducted archaeological investigations during design phases, TxDOT was able to move quickly when an entire cemetery was discovered in the right of way during construction. The department immediately fenced off the area, posted 24-hour security, and initiated innovative techniques in archeological investigation, construction and public and tribal involvement. See http://www.fhwa.dot.gov/environment/strmlng/aug03nl.htm.

VALUE ENGINEERING CONFERENCE ABSTRACTS A CLICK AWAY

If you missed the AASHTO Value Engineering Conference in Tampa, Florida July 15-18, you can now access abstracts and full texts of its dozens of papers and presentations organized in three tracks: Case Studies, Starting and Maintaining a VE Program, and Advanced Tools and Techniques. http://www11.myflorida.com/qualityinitiativesoffice/projectmgmt/value.htm.

DESIGN EXCEPTION PRACTICES REVEALED

State transportation agencies, to no one's surprise, seem to handle design exception practices in different ways. In most agencies, design exceptions are subject to central office approval and in others regional offices approve; almost half have design criteria standards higher than AASHTO, and approve design exceptions to meet those standards; a third prepare exceptions based on supplemental criteria. See the NCHRP's latest on this, "Synthesis 316: Design Exception Practices" at http://gulliver.trb.org/news/blurb_detail.asp?id=1637.

NEW STUDY OF EARTH MATERIAL PROPERTIES AVAILABLE

"Geology and Properties of Earth Materials 2003," Transportation Research Record 1821, is now available in the WisDOT Library. The volume is comprised of TRB papers on highway thawing, effects of air convection on embankments, frost heave prediction, models for predicting soil moisture flow, and more. Courtesy of the TRB E-newsletter: http://gulliver.trb.org/news/blurb_detail.asp?id=1744.

CATHODIC PROTECTION STUDY RELEASED

A new FHWA publication from Turner-Fairbank Highway Research Center reports on the long-term usefulness of various auxiliary anode materials used for cathodic protection in reinforced concrete bridges. Titanium mesh and ribbon were found to offer the longest life, as well as excellent protection. Courtesy of TRB E-newsletter: http://www.tfhrc.gov/pavement/ltpp/reports/01096.htm.

Construction and Materials Innovations

FLY ASH AND CONCRETE DEBRIS UNDER THE MICROSCOPE

Two articles in the September/October 2003 *Journal of Transportation Engineering* consider alternative pavement constituents. For abstracts and ordering information, go to http://ojps.aip.org/dbt/dbt.jsp?KEY=JTPEDI&Volume=CURVOL&Issue=CURISS.

- Investigators in "Factors Influencing the Strength of Cement Fly Ash Base Courses" evaluated the impact of six different curing conditions and various dry unit weight and water contents on two Indian fly ashes and a commercial Portland cement. Also see WisDOT's "Field Performance of Sub-bases Constructed with Industrial Byproducts," due to be completed soon. http://www.dot.wisconsin.gov/library/research/reports/soils.htm
- In "Application of Construction and Building Debris as Base and Subbase Materials in Rigid Pavement," a researcher evaluated the physical properties and performance of dry and wet recycled concrete aggregate as base and subbase for concrete pavement. The materials were found comparable to stone aggregate in falling weight deflectometer tests. Compactibility, stability, shear resistance and particle breakage were evaluated via the U.S. Army Corps of Engineers Gyratory Testing Machine.

CONNECTICUT MONITORS BRIDGE CONDITION ELECTRONICALLY

"Research Pays Off" in Connecticut, where the state DOT has been using electronic monitoring systems to keep tabs on the condition of some of its bridges. Systems of linked sensors provide data on structural integrity and wear, and contribute to bridge life and stress assessment data. Portable and continuous systems have been installed on 11 bridges since 2002, allowing for early repair in sites that need it, and saving an estimated $2.7 million. Courtesy of the TRB E-Newsletter: http://gulliver.trb.org/publications/trnews/rpo/rpo.trn224.pdf.

MILITARY CONCRETE PAVEMENT REPAIR PRACTICES

The American Concrete Pavement Association offers on its Web site an 80-page, pocket-sized, annotated version of the Defense Department's concrete pavement repair manual. Repair guidelines include full and partial-depth patches, load transfer restoration, and diamond grinding, as well as photos and diagrams. See http://www.pavement.com/Ecommerce/main.html to order.

REPORTS SHOW HOW TO GAUGE HMA RUTTING

NCHRP Report No. 478, "Relationship of Superpave Gyratory Compaction Properties to HMA Rutting Behavior," shows the limits within which the compactor can effectively predict potential rutting in hot-mix asphalt designs when exposed to the shear stresses of traffic loads. Read it at http://gulliver.trb.org/publications/nchrp/nchrp_rpt_478.pdf. Structural characteristics of pavement also influence rutting. Read Report 468, "Contributions of Pavement Structural Layers to Rutting of Hot Mix Asphalt Pavements," at http://gulliver.trb.org/publications/nchrp/nchrp_rpt_468-a.pdf.

OREGON RECLAIMING ASPHALT PAVING MATERIALS

A report for Oregon DOT by the Asphalt Pavement Association describes use of volumetric equations to determine asphalt content in recycled asphalt pavement. See the study at http://www.odot.state.or.us/tddresearch/reports/rap.pdf. Courtesy of TRB E-Newsletter. For use of reclaimed asphalt in Superpave, see NCHRP Report 452 at http://gulliver.trb.org/publications/nchrp/nchrp_rpt_452.pdf.

NOMINATE AN ASPHALT PAVEMENT YOU KNOW AND LOVE

The 2003 Perpetual Pavement Awards, for hot-mix asphalt pavements that have stood for 35 years or more without major rehabilitation, will be collected by the Asphalt Pavement Alliance through September 30. Winners will be announced November 15. See details and forms at http://www.asphaltalliance.com/singlenews.asp?item_ID=229.

Operating/Optimizing the System

NEW LOOK FOR FHWA OPERATIONS SITE

The Federal Highway Administration has redesigned its Office of Operations Web site to be more attractive, user-friendly and informative. Find news, FHWA reports, and policy guides related to operations. Individual program area Web sites (Traffic Incident Management, Freeway Management, Freight Operations, etc.) will soon be redesigned with the same template. http://ops.fhwa.dot.gov/index.asp

BEST PRACTICES FOR ROAD WEATHER MANAGEMENT

Completed in May 2003 for the Federal Highway Administration, this report reviews systems in 21 states for improving roadway operations in inclement weather. Each case study describes the system, its components, operational procedures, outcomes and implementation issues, as well as providing contact information and references. Courtesy of the Transportation Communications Newsletter: http://www.itsdocs.fhwa.dot.gov//JPODOCS/REPTS_TE//13828.html

ITS/OPERATIONS RESOURCE GUIDE 2003

Fresh off the press, the "ITS/Operations Resource Guide 2003" is an indispensable resource for transportation operations professionals. It provides a comprehensive listing of over 400 documents, Web sites, training courses, software tools and points of contact related to transportation security, planning, system operations, transit, freight operations, and the Intelligent Vehicle Initiative. http://www.its.dot.gov/itsweb/guide.html

MDSS COMPLETES DEMONSTRATION AND FIELD TEST

FHWA's Maintenance Decision Support System (MDSS) will assist road maintenance managers at state DOTs, local agencies and private industry in treating roadways and predicting the impact of adverse weather. MDSS will even allow users to pose "what if" scenarios by editing a recommended MDSS treatment plan and seeing what would happen if they took no action, used the recommended plan, or employed some modification of it. Link to the article in *R&T Transporter* at http://www.tfhrc.gov/trnsptr/mar03/index.htm#op

WORK ZONE SAFETY INFORMATION IN A SEARCHABLE DATABASE

The National Work Zone Safety Information Clearinghouse recently updated its research database. Search 1,233 records of journal articles, research reports, research projects, and other types of publications related to work zone safety. http://wzsafety.tamu.edu/searches/research.stm

RUMBLING THROUGH WORK ZONES

According to a July 2003 report by the Transportation Research and Development Bureau of the New York State Department of Transportation, the use of temporary rumble strips at work zones is an effective safety tool that should be continued. See the full report at http://www.dot.state.ny.us/tech_serv/trdb/files/sr140.pdf. Courtesy of the Transportation Communications Newsletter.

ASSET MANAGEMENT AUSSIE STYLE

The Austroads Asset Management Reference Group Web site is a valuable resource for transportation professionals interested in managing road assets to meet the needs of business and private road users at the lowest possible cost over time. The site provides access to numerous publications and best practices, as well as a listing of the group's research in progress. http://www.austroads.com.au/amrg.php

Safe Travel/Smart Travel

DELAWARE DEPLOYS VARIABLE SPEED LIMIT SIGNS

The Delaware Department of Transportation has begun to install 23 variable speed limit (VSL) signs on Interstate 495, the first step towards an anticipated VSL deployment statewide on approximately 150 miles of freeways and major highways in the state. Controlled by DelDOT's new DelTrac system, the new VSL capability will enable the agency to temporarily lower maximum legal speeds to help reduce air pollution or manage incidents more effectively. Link to story in the Newsletter of the ITS Cooperative Deployment Network:
http://www.nawgits.com/icdn/deldot_vsl.html.
Courtesy of the Transportation Communications Newsletter.

NEW TRAVELER SERVICES FROM GEORGIA

Georgia DOT has enhanced its NaviGAtor site with more maps, custom travel time start/end selections, alerts, news items, more cameras, larger camera images and weather stations. Link to http://www.georgia-navigator.com/, courtesy of the Transportation Communications Newsletter. See http://www.dot.state.wi.us/travel/index.htm for WisDOT's online traveler information service.

CANADIANS LOOK AT SAFETY FOR TRAFFIC OPERATIONS

This extensive synthesis, published in March 2003, includes information on the safety impacts of traffic operations and control strategies that are most urgent/useful to practitioners. Based on a literature and Internet review and interviews with practitioners, it addresses intersection control, signs, markings, pedestrian and bicycle issues, enforcement, turn lanes and traffic calming.
http://www.intus.ca/synthesis/Synthesis_Final_Report.pdf

HUMAN FACTORS RESEARCH IN MINNESOTA AND THE NETHERLANDS

The HumanFIRST Program at the University of Minnesota is aimed at making transportation technologies more user-friendly, and ensuring that future products are designed with the human in mind. http://www.its.umn.edu/labs/humanfirst.html
The Netherlands Organization for Applied Scientific Research (TNO) includes a Human Factors Institute focusing on human behavior and performance in a technical environment. Within the area of Traffic and Transport, Human Factors focuses on issues such as perception and road design, traffic management, driver support, driver modeling and driver skills.
http://www.tm.tno.nl/business_areas/traffic_transp.html

PUTTING ITS TO WORK IN WORK ZONES

"Intelligent Transportation Systems in Work Zones: A Cross-Cutting Study" looks at how four DOTs (Michigan, Illinois, New Mexico and Arkansas) successfully used ITS in work zones and profiles other ITS technology such as variable speed limit systems, intrusion alarms and the Wizard CB Alert System for truckers. www.itsdocs.fhwa.dot.gov/jpodocs/repts_te/13600.html
Also see WisDOT's test of a new work zone speed advisory system as part of the pooled fund study, Midwest States Smart Work Zone Deployment Initiative:
http://www.dot.wisconsin.gov/news/news/3/2003/imstest-us41.htm.

DATA FUSION – FOR ADVANCED TRAVELER INFORMATION SERVICES

This extensive May 2003 USDOT report examines technical, institutional and economic aspects of the emerging field of "data fusion" for ATIS – combining data from, for example, loop detectors, closed circuit television images and automatic vehicle locator systems into a single stream of information for travelers. General guidelines for data fusion architectures are included.
http://www.itsdocs.fhwa.dot.gov/JPODOCS/REPTS_TE/13837.html